PATENT ABSTRACTS OF JAPAN

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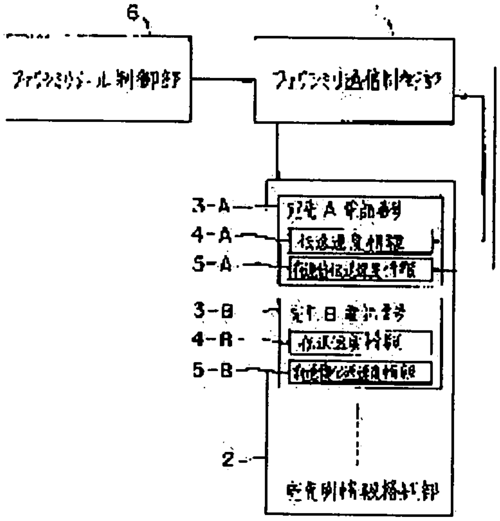
(22)Date of filing :	24.01.1992	(72)Inventor :	YOSHIMOTO KAZUMASU

(54) TRANSMISSION RATE DESIGNATING SYSTEM IN FACSIMILE STORE AND FORWARD EXCHANGE

(57)Abstract:

PURPOSE: To attain the automatic optimization of the setting of sending transmission rate for every destination when facsimile data is sent to the many destinations for which definite line quality can not be ensured.

CONSTITUTION: When a transmission request from a facsimile mail control part 6 arises, a facsimile communication control part 1 reads data transmission rate information out of the data transmission rate information area 4-A, 4-B,... of an information table 3-A, 3-B,... classified by the destination corresponding to a transmitting destination in an information storage part 2 classified by the destination, and determines it as the data transmission rate at the time of transmission, and after the transmission by this data transmission rate, it stores this data transmission rate information in the previous communication data transmission rate information area 5-A, 5-B,... of the information table 3-A, 3-B,... classified by the destination as previous communication data transmission rate information.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

CLAIMS

[Claim(s)]

[Claim 1] In the facsimile store-and-forward-switching equipment which performs the store and forward switching of facsimile data The facsimile communications control section which realizes a facsimile communication procedure (1), The information storing section classified by destination which has an information table classified by destination (3-A, 3-B, ...) for every transmitting destination (2), The facsimile mail control section (6) which realizes facsimile store-and-forward-switching service is offered. The area (4- A, 4- B, ...;5- A, 5- B, ...) which can memorize data transmission rate information and front communication link data transmission rate information is set as this information table classified by destination (3-A, 3-B, ...). When there is a Request to Send from this facsimile mail control section (6), this facsimile communications control section (1) This data transmission rate information is read from the data transmission rate information area (4-A, 4-B, ...) of this information table classified by destination (3-A, 3-B, ...) applicable to the transmitting destination in this information storing section classified by destination (2). After determining this as a data transmission rate at the time of transmission and transmitting with this data transmission rate The transmitting rate assignment method in facsimile store-and-forward-switching equipment characterized by storing this data transmission rate information in communication link-before this information table classified by destination (3-A, 3-B, ...) data transmission rate information area (5-A, 5-B, ...) as front communication link data transmission rate information.

[Claim 2] After transmitting termination, in the communication link-before this data transmission rate information area (5-A, 5-B, ...) of this information table classified by destination (3-A, 3-B, ...) After storing front communication link data transmission rate information, when a Request to Send is in the same destination again from this facsimile mail control section (6), this facsimile communications control section (1) Communication link-before this data transmission rate information is stored in this data transmission rate information area (4-A, 4-B, ...) of this information table classified by destination (3-A, 3-B, ...) applicable to the transmitting destination in this information storing section classified by destination (2). The transmitting rate assignment method in facsimile store-and-forward-switching equipment according to claim 1 which reads communication link-before this data transmission rate information from this data transmission rate information area (4-A, 4-B, ...), and is characterized by determining this as a data transmission rate at the time of transmission.

[Claim 3] The transmitting rate assignment method in facsimile store-and-forward-switching equipment according to claim 1 which will be characterized by setting a system definition rate as this data transmission rate information area (4-A, 4-B, ...) in this information table classified by destination (3-A, 3-B, ...) if the Request to Send to the same destination from this facsimile mail control section (6) becomes the count of predetermined.

[Claim 4] If predetermined time passes after storing front communication link data transmission rate information in the communication link-before this data transmission rate information area (5-A, 5-B, ...) of this information table classified by destination (3-A, 3-B, ...) The transmitting rate assignment method in facsimile store-and-forward-switching equipment according to claim 1 characterized by setting a system definition rate as this data transmission rate information area (4-A, 4-B, ...) in this information table classified by destination (3-A, 3-B, ...).

[Claim 5] When the demand which resets the transmission-speed assignment to each transmission place at a system definition rate occurs in this facsimile mail control section (6), This facsimile communications control section (1) in the data transmission rate information area (4-A, 4-B, ...) of this information table classified by destination (3-A, 3-B, ...) in this information storing section classified by destination (2), and communication link-before this data transmission rate information area (5-A, 5-B, ...) The transmitting rate assignment method in facsimile store-and-forward-switching equipment according to claim 1 characterized by setting up a system definition rate.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the transmitting rate assignment method in facsimile store-and-forward-switching equipment. The cutback of the communication link cost by compaction of communication link time amount is demanded with the laborsaving at the time of facsimile distribution with broadening of a facsimile network in recent years, and the increment in utilization frequency.

[0002] For this reason, although various original communication procedure facsimile communication devices which realize improvement in the speed of a data transmission rate and communication procedure time amount compaction are offered When communication line quality is bad and an error is detected by the training check sequence before data transmission If many data errors occur in a receiving side even when it is necessary to perform the fall back of transmission speed and and an error is not detected by training check sequence since generating of the data error on a transmission line is predicted It may return to beginning, it is necessary to perform the fall back of transmission speed, and there may be [for which retransmission of message of data is needed] a communication procedure.

[0003]

[Description of the Prior Art] Although drawing 4 is the block diagram showing the transmitting rate assignment method in the conventional facsimile swap device, in this drawing 4 , 41 is the facsimile communications control section, and this facsimile communications control section 41 receives transmitting directions from the facsimile mail control section 45, and performs facsimile transmitting procedure processing to the directed transmitting destination.

[0004] 42 is the information storing section classified by destination, and this information storing section 42 classified by destination is equipped with information table 43classified by destination-A corresponding to each destination, 43-B, and ... And it consists of the destination telephone number of the destination where information table 43classified by destination-A, 43-B, and ... correspond, respectively, data transmission rate information area 44-A, 44-B, and ...

[0005] 45 is a facsimile mail control section and this facsimile mail control section 45 directs data communication to the facsimile communications control section 41. Although an above-mentioned configuration performs the following actuation, it explains using the flow chart showing actuation of the facsimile communications control section 41 which shows this actuation to drawing 5 . First, if the facsimile communications control section 41 receives the instruction from the facsimile mail control section 45, and it will progress to step t2 and will not receive at step t1, it returns to a start. And at step t2, if the instruction from the facsimile mail control section 45 is a Request to Send, it will progress to step t3, and if it is not a Request to Send, it will return to a start.

[0006] Furthermore, although reading of the transmitting destination notified to the facsimile communications control section 41 from the facsimile mail control section 45 is performed at step t3 and the destination is A in the following explanation, for example, the point is the same in other destinations. And in the following step t4, the transmission-speed capacity (system definition rate) of equipment immobilization is written in data transmission rate information area 44-A, and the facsimile communications control section 41 starts a rate negotiation at step t5 further from the value (= system definition rate) memorized by communication link place facsimile and data transmission rate information area 44-A. And data transmission is performed at the rate determined by the negotiation at step t6, and a communication link is completed at step t7.

[0007]

[Problem(s) to be Solved by the Invention] however, by the transmitting rate assignment method in such conventional facsimile store-and-forward-switching equipment If communication line quality is bad and the incidence rate of the data error on a transmission line becomes high, it will set to the training check sequence before data transmission. Even if re-training and the fall back of transmission speed are required from a partner facsimile terminal or a training check is successful Since the error rate of the drawing data which the partner facsimile terminal received is high after transmission and re-training and resending of data are required from a partner facsimile terminal, When performing data transmission to the destination which uses a circuit of inferior quality In order re-training or data resending is needed, and the problem that communication link time amount becomes long substantially arises by this and to avoid re-training and data resending each time When the transmission-speed capacity of equipment immobilization was set up low beforehand, also to other destinations with sufficient circuit quality, it transmitted at a low speed and the problem that communication link time amount became long too had arisen.

[0008] It was not originated in view of such a technical problem, and this invention aims at offering the transmitting rate assignment method in facsimile store-and-forward-switching equipment which enabled it to perform automatic optimization of transmitting transmission-speed setting out for every destination, when transmitting facsimile data to the a large number destination which cannot guarantee fixed circuit quality.

[0009]

[Means for Solving the Problem] Drawing 1 is the principle block diagram of this invention, in this drawing 1 , 1 is the facsimile communications control section and this facsimile communications control section 1 realizes a facsimile exchange procedure. 2 is the information storing section classified by destination, and this information storing section 2 classified by destination has information table 3classified by destination-A, 3-B, and ... for every transmitting destination.

[0010] Here, area 5-A which can memorize communication link-in front of the destination which corresponds with area 4-A [which can memorize the data transmission rate information on the destination corresponding to information table 3classified by destination-A, 3-B, and ...], 4-B, and ... data transmission rate information, 5-B, and ... are set up. 6 is a facsimile mail control section and this facsimile mail control section 6 realizes facsimile store-and-forward-switching service.

[0011]

[Function] By the transmitting rate assignment method in the facsimile store-and-forward-switching equipment of above-mentioned this invention When there is a Request to Send from the facsimile mail control section 6, the facsimile communications control section 1 Data transmission rate information is read from information table 3classified by destination-A applicable to the transmitting destination in the information storing section 2 classified by destination, 3-B, data transmission rate information area 4-A of ..., 4-B, and ... After determining this as a data transmission rate at the time of transmission and transmitting with this data transmission rate Storing this data transmission rate information in information table 3classified by destination-A, 3-B, communication link-before ... data transmission rate information area 5-A, 5-B, and ... as front communication link data transmission rate information is performed (claim 1).

[0012] After transmitting termination, moreover, to information table 3classified by destination-A, 3-B, communication link-before ... data transmission rate information area 5-A, 5-B, and ... After storing front communication link data transmission rate information, when a Request to Send is in the same destination again from the facsimile mail control section 6, the facsimile communications control section 1 Front communication link data transmission rate information is stored in information table 3classified by destination-A applicable to the transmitting destination in the information storing section 2 classified by destination, 3-B, data transmission rate information area 4-A of ..., 4-B, and ... Reading front communication link data transmission rate information from this data transmission rate information area 4-A, 4-B, and ..., and determining this as a data transmission rate at the time of transmission is performed (claim 2).

[0013] In addition, if the Request to Send to the same destination from the facsimile mail control section 1 becomes the count of predetermined To information table 3classified by destination-A, 3-B, data transmission rate information area 4-A in ..., 4-B, and ... Set up a system definition rate or to information table 3classified by (claim 3) destination-A, 3-B, communication link-before ... data transmission rate information area 5-A, 5-B, and ... If predetermined time passes after storing front communication link data transmission rate information, a system definition rate may be set as information table 3classified by destination-A, 3-B, data transmission rate information area 4-A in ..., 4-B, and ... (claim 4).

[0014] Furthermore, when the demand which resets the transmission-speed assignment to each transmission place at a system definition rate occurs in the facsimile mail control section 6, The facsimile communications control section 1 to information table 3classified by destination-A in the information storing section 2 classified by destination, 3-B, data transmission rate information area 4-A of ..., 4-B, ... and front communication link data transmission rate information area 5-A, 5-B, and ... Setting up a system definition rate is performed (claim 5).

[0015]

[Example] Hereafter, one example of this invention is explained with reference to a drawing. Drawing 2 is the block diagram showing one example of this invention, and in this drawing 2 , 20 is a facsimile mail equipment, and this facsimile mail equipment 20 performs the store and forward switching of facsimile data, had 9600bps as transmission-speed capacity of system definition, and is equipped with the facsimile communications control section 21, the information storing section 22 classified by destination, and the facsimile mail control section 26.

[0016] Here, the facsimile communications control section 21 receives facsimile transmitting directions from the facsimile mail control section 26, and performs facsimile transmitting procedure processing to the directed transmitting destination. Moreover, the information storing section 22 classified by destination has information storing table 23classified by destination-A, 23-B, 23-C, and 23-D for every destination. and Information storing table 23classified by destination-A, 23-B, 23-C, and 23-D area 25-A which can memorize area 24-A which can memorize the data transmission rate information on the destination that it corresponds, 24-B, 24-C, and 24-D and front communication link data transmission rate information, 25-B, 25-C, and 25-D It has and the telephone number of the corresponding destination, data transmission rate information, and front communication link data transmission rate information are memorized.

[0017] Furthermore, the facsimile mail control section 26 performs directions of data transmission and rate assignment to the facsimile communications control section 21. By the way, 27 is a switched circuit and this switched circuit 27 consists of private-branch-exchange network 28-A, 28-B, 28-C, and public switched-network 28-D. Moreover, A, B, C, and D are facsimile terminals, these facsimile terminals A, B, C, and D are connected to the switched network (private-branch-exchange network 28-A, 28-B, 28-C, public switched-network 28-D) which corresponds, respectively, and each terminal of data receiving rate capacity is 9600bps.

[0018] And the circuit quality between a facsimile mail equipment 20 and the facsimile terminals A and B is good, the probability for an error to occur in the data transmission in 9600bps is dramatically low, the circuit quality between the facsimile terminals C is a little bad, and according to an error incidence rate being high in the data transmission in 9600bps, although it is necessary to carry out a fall back to 7200bps, in 7200bps, an error incidence rate becomes low at extent which can be disregarded. Moreover, the circuit quality between a facsimile mail equipment 20 and the facsimile terminal D is dramatically bad, and if it is not 4800bps or less in data rate, error generating is carried out and it cannot communicate.

[0019] An above-mentioned configuration performs the following actuation. First, if transmission-speed setups are set as the facsimile mail control section 26 in a facsimile mail equipment 20 and a system is started The facsimile communications control section 21 is received from the facsimile mail control section 26 at the time of starting. Transmission-speed setups are directed and reset of transmission-speed assignment information is directed. System definition transmission speed is set to data transmission rate information area 24-A of information table 23classified by destination-A, 23-B, 23-C, and 23-D, 24-B, 24-C, 24-D, and before data transmission rate information area 25-A, 25-B, 25-C and 25-D.

[0020] Hereafter, it explains along with the flowchart of the facsimile communications control section 21 of operation shown in drawing 3 . First, if the facsimile communications control section 21 receives an instruction from the facsimile mail control section 26, and step S1 will progress to step S2 and will not receive an instruction, it returns to a start. And at step S2, if the received instruction is a Request to Send, it will progress to step S3, and if it is not a Request to Send, it will progress to step S14.

[0021] Although the destination notified from the facsimile mail control section 26 is read at step S3, this destination is now used as the facsimile terminal C. In the following step S4, actuation changes with transmission-speed setups set as the facsimile mail control section 26. When transmission-speed setups are "considering as the data transmission rate before each time", it progresses to step S8. Since 9600bps in system definition rate is written in before data transmission rate information area 25-C about [having started the system] in this case, at step S8, 9600bps memorized by before data transmission rate information area 25-C is written in data transmission rate information area 24-C.

[0022] Subsequently, at step S10, the facsimile communications control section 21 starts a rate negotiation from the value (= 9600bps) memorized by the facsimile terminal C of a transmission place, and data transmission rate information area 24-C. If it is decided by the negotiation that a transmitting rate will be 7200bps, data will be transmitted at step S11 at 7200bps. Termination of a communication link writes in 7200bps in rate determined as before data transmission rate information area 25-C by the negotiation (step S13). (step S12)

[0023] Since a rate negotiation is performed from 7200bps of a before data transmission rate by this when transmitting data to the facsimile terminal C again next, it becomes possible to omit the time amount which was required for the re-line of training check sequence, or resending of data. When transmission-speed setups are "resetting after a before data transmission rate, however T hour progress, and making it a system definition rate", it progresses to step S5 from step S4. If T hours have not passed since the time of pre- reset, actuation same with having progressed to step S8 and having stated previously is performed, but if T hours have passed since the time of pre- reset, it progresses to step S7, and before data transmission rate information will be reset and 9600bps in system definition rate will be written in before data transmission rate information area 25-C. It progresses to step S8 after this, and actuation same with having stated previously is performed.

[0024] When transmission-speed setups are "resetting after a before data transmission rate, however N time communication link, and making it a system definition rate", it progresses to step S6 from step S4. If N time communication link is not performed from the time of pre- reset, actuation same with having progressed to step S8 and having stated previously is performed, but if N time call is carried out from the time of pre- reset, it will progress to step S7 and actuation same with having stated previously will be performed.

[0025] As mentioned above, if transmission-speed setups carry out for "it resetting after a before data transmission rate, however T hour progress, and making it a system definition rate", or "resetting after a before data transmission rate, however N time communication link, and making it a system definition rate" Since a data transmission rate can be periodically returned to a system definition rate, even when deterioration of circuit quality occurs and a data transmission rate falls from a certain cause, it is possible to recover a data transmission rate at a high speed within fixed time amount and the count of fixed.

[0026] When transmission-speed setups are a "system definition rate", it progresses to step S9 and 9600bps in system definition rate is memorized by data transmission rate information area 25-C. Subsequently, it progresses to step S10 and actuation same with having stated above is performed. In addition, at step S14, if the instruction which the facsimile communications control section 21 received from the facsimile mail control section 26 is a reset instruction, it will progress to step S15, and if it is not a reset instruction, it will return to a start.

[0027] At step S15, 9600bps in system definition rate is written in before data transmission rate information area 25-A, 25-B, 25-C, and 25-D, and a system definition rate is simultaneously written also in data transmission rate information area 24-A, 24-B, 24-C, and 24-D at step S16. Since it is possible for it not to be concerned with transmission-speed setups, but to reset a data transmission rate at a system definition rate compulsorily with this reset instruction, even when deterioration of the circuit quality by a certain sudden factor occurs, it is possible after circuit quality recovery to recover transmission speed at a high speed promptly.

[0028] In addition, also when the destinations are other facsimile terminals other than the facsimile terminal C, the almost same actuation as an above-mentioned case is performed.

[0029]

[Effect of the Invention] As explained in full detail above, according to the transmitting rate assignment method in the facsimile store-and-forward-switching equipment of this invention Since it becomes possible to avoid resending of the training check sequence for the data error generating evasion by high-speed transmission, and resending of data at the time of the e-mail transmission which used the circuit with the bad quality for which a transmission-speed fall back is needed, The effectiveness that communication link time amount can be shortened is done so, and since optimization of transmission speed can be automatically performed for every e-mail destination, there is an advantage that the place which contributes to the laborsaving in construction and maintenance of a system is large (claims 1 and 2).

[0030] Moreover, even when circuit quality deteriorates temporarily and a data transmission rate falls by the ability setting up or resetting a data transmission rate at a system definition rate compulsorily so that a data transmission rate may be reset at a system definition rate for every fixed time amount and every count of fixed, there is also an advantage which becomes possible [recovering a data transmission rate at a high speed promptly] after circuit quality recovery (claims 3 and 4).

[0031] Moreover, since it cannot be concerned with transmission-speed setups but a data transmission rate can be compulsorily reset at a system definition rate with a reset instruction even when deterioration of the circuit quality by a certain sudden factor occurs, there is also an advantage which can recover transmission speed at a high speed promptly after circuit quality recovery (claim 5).

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the principle block diagram of this invention.

[Drawing 2] It is the block diagram showing one example of this invention.

[Drawing 3] It is the operation flow chart of the facsimile communications control section in one example of this invention.

[Drawing 4] It is the block diagram showing the conventional example.

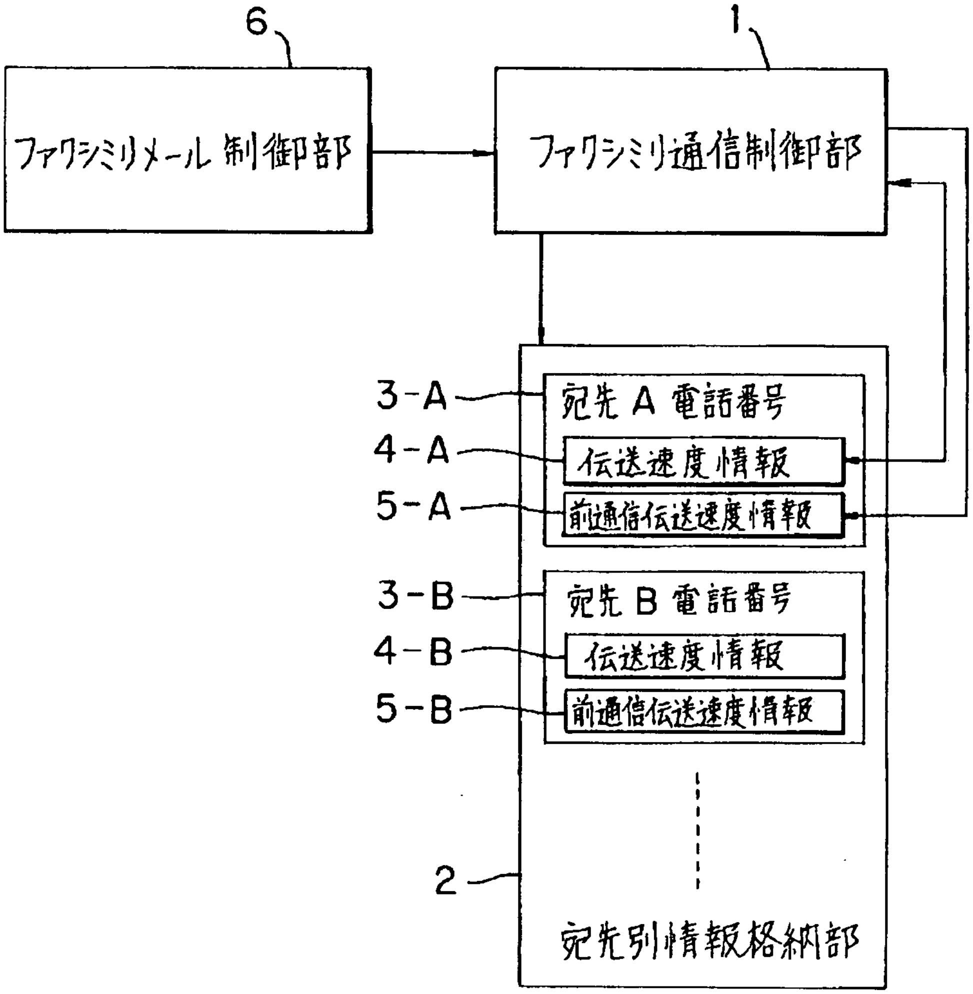
[Drawing 5] It is the operation flow chart of the facsimile communications control section in the conventional example.

[Description of Notations]

1, 21, 41 Facsimile communications control section
2, 22, 42 The information storing section classified by destination
3-A, 3-B, 23-A, 23-B, 23-C, 23-D, 43-A, 43-B Information table classified by destination
4-A, 4-B, 24-A, 24-B, 24-C, 24-D Data transmission information area
5-A, 5-B, 25-A, 25-B, 25-C, 25-D Before data transmission information area
6, 26, 45 Facsimile mail control section
20 Facsimile Mail Equipment
27 Switched Circuit
28-A, 28-B, 28-C Private-branch-exchange network
28-D Public switched network
44-A, 44-B Data transmission rate information area
A, B, C, D Facsimile terminal

Drawing selection drawing 1

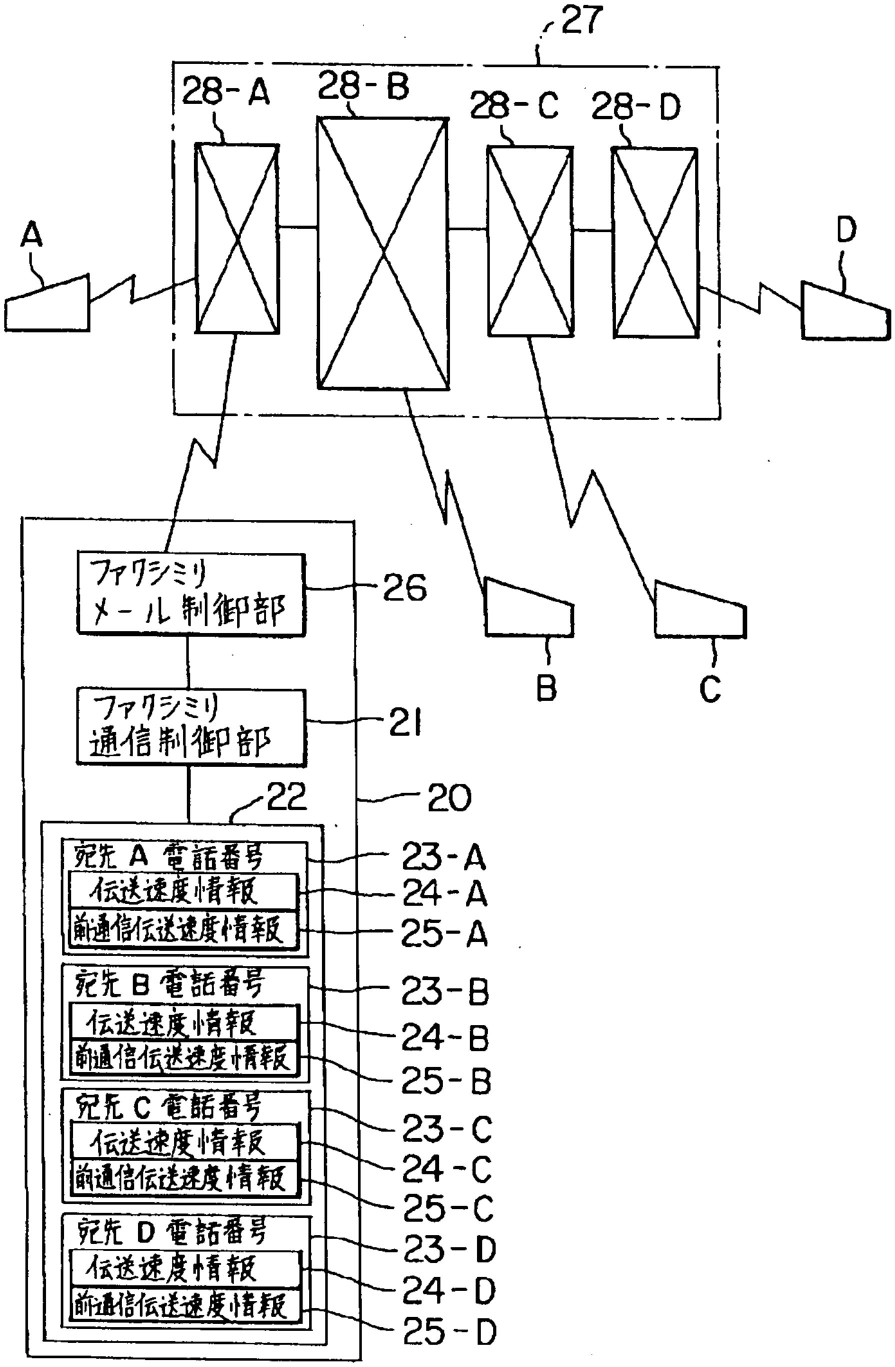
本発明の原理ブロック図



6
ファクシミリメール制御部
1
ファクシミリ通信制御部
3-A
宛先 A 電話番号
4-A
伝送速度情報
5-A
前通信伝送速度情報
3-B
宛先 B 電話番号
4-B
伝送速度情報
5-B
前通信伝送速度情報
2
宛先別情報格納部

[Translation done.]

本発明の一実施例を示すブロック図


27
28-A
28-B
28-C
28-D
A
D
ファクシミリ
メール制御部
26
B
C
ファクシミリ
通信制御部
21
22
20
宛先 A 電話番号
伝送速度情報
前通信伝送速度情報
23-A
24-A
25-A
宛先 B 電話番号
伝送速度情報
前通信伝送速度情報
23-B
24-B
25-B
宛先 C 電話番号
伝送速度情報
前通信伝送速度情報
23-C
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25-C
宛先 D 電話番号
伝送速度情報
前通信伝送速度情報
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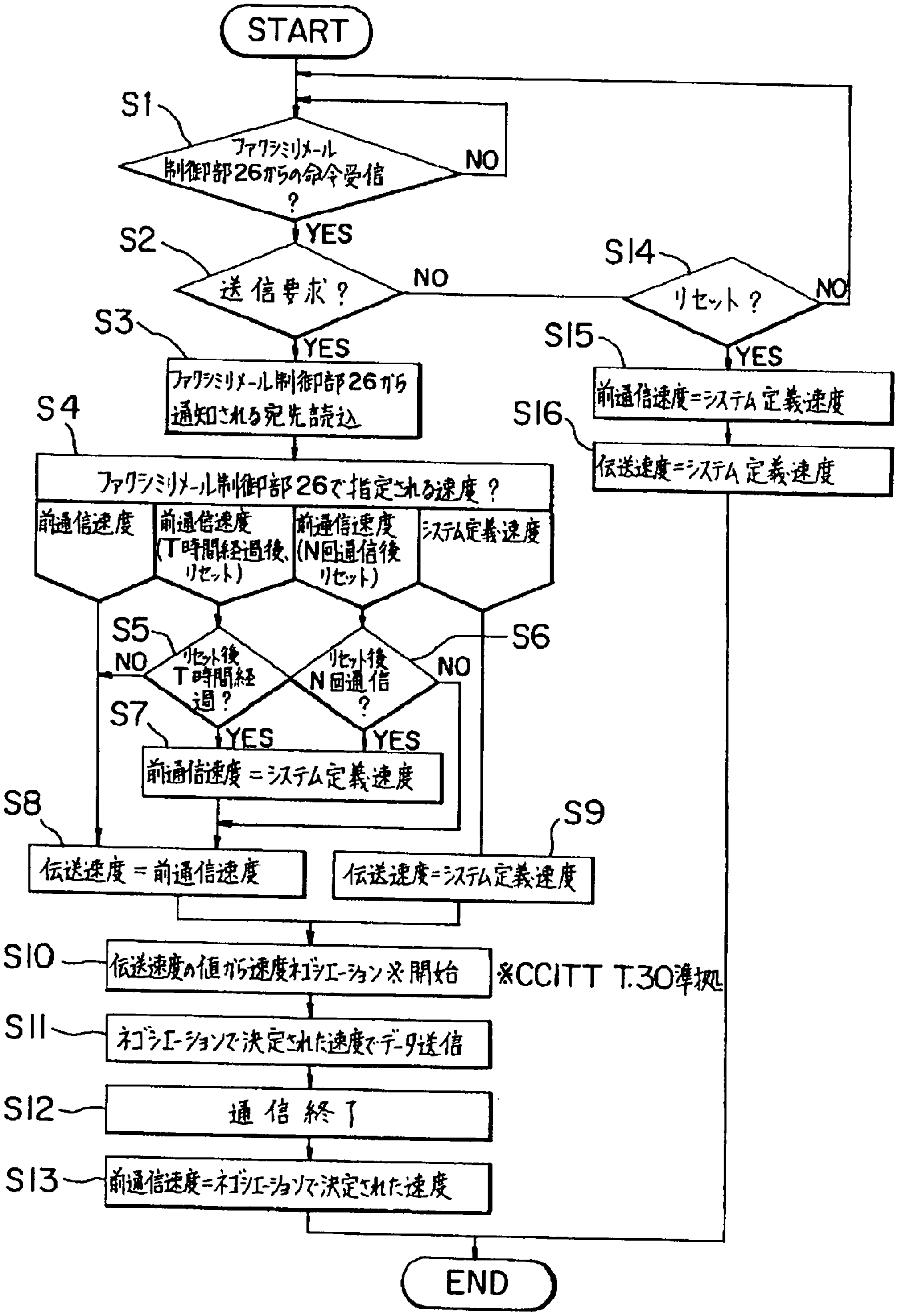
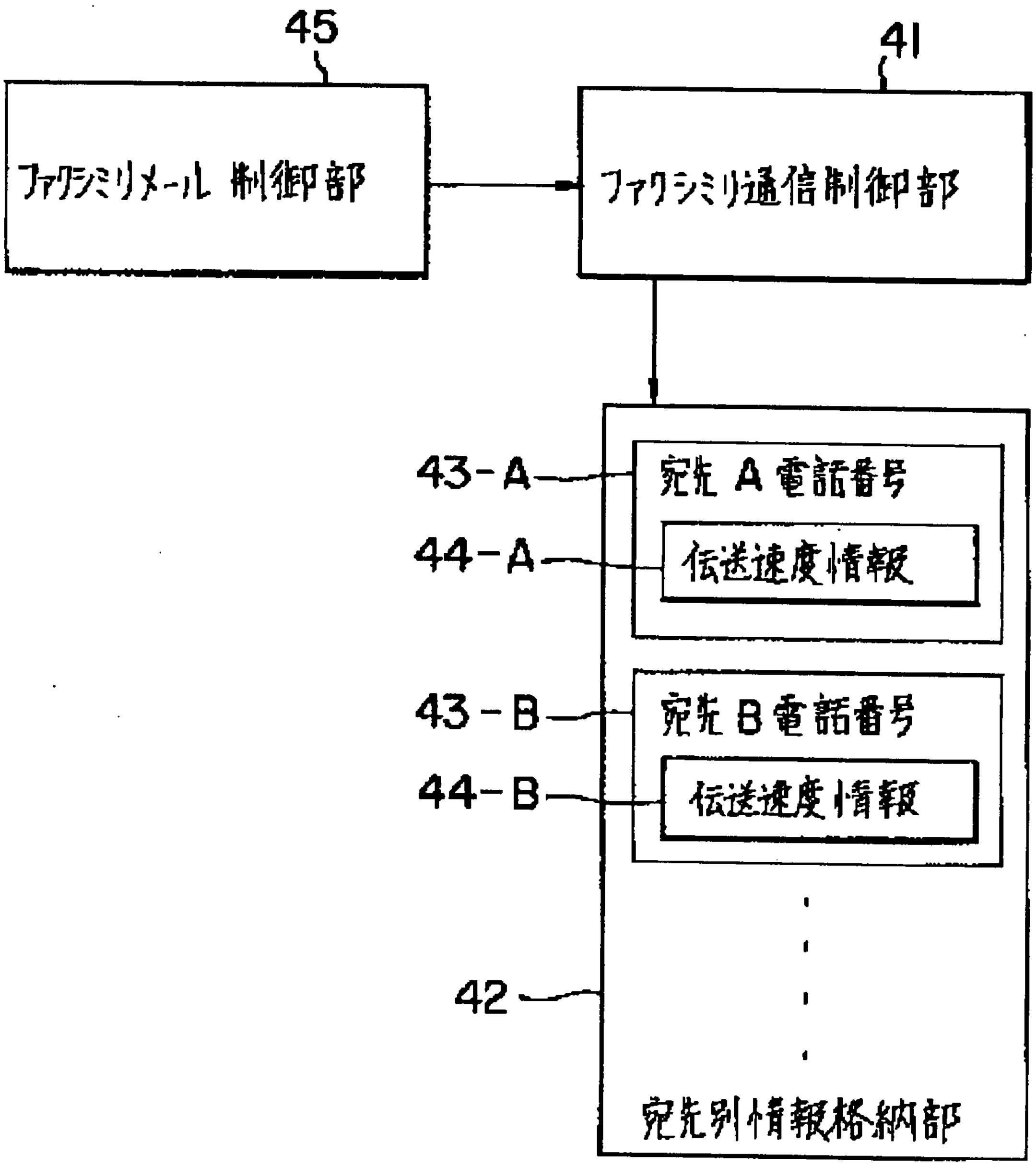
24-D
25-D

・本発明の一実施例におけるファクシミリ通信制御部の動作フローチャート


START
S1
ファクシミリメール制御部26からの命令受信？
NO
YES
S2
送信要求？
NO
YES
S14
リセット？
NO
YES
S3
ファクシミリメール制御部26から通知される宛先読込
S15
前通信速度＝システム定義速度
S16
伝送速度＝システム定義速度
S4
ファクシミリメール制御部26で指定される速度？
前通信速度
前通信速度（T時間経過後、リセット）
前通信速度（N回通信後リセット）
システム定義速度
S5
リセット後T時間経過？
NO
YES
S6
リセット後N回通信？
NO
YES
S7
前通信速度＝システム定義速度
S8
伝送速度＝前通信速度
S9
伝送速度＝システム定義速度
S10
伝送速度の値から速度ネゴシエーション※開始
※CCITT T.30準拠
S11
ネゴシエーションで決定された速度でデータ送信
S12
通信終了
S13
前通信速度＝ネゴシエーションで決定された速度
END

従来例を示すブロック図


45
41
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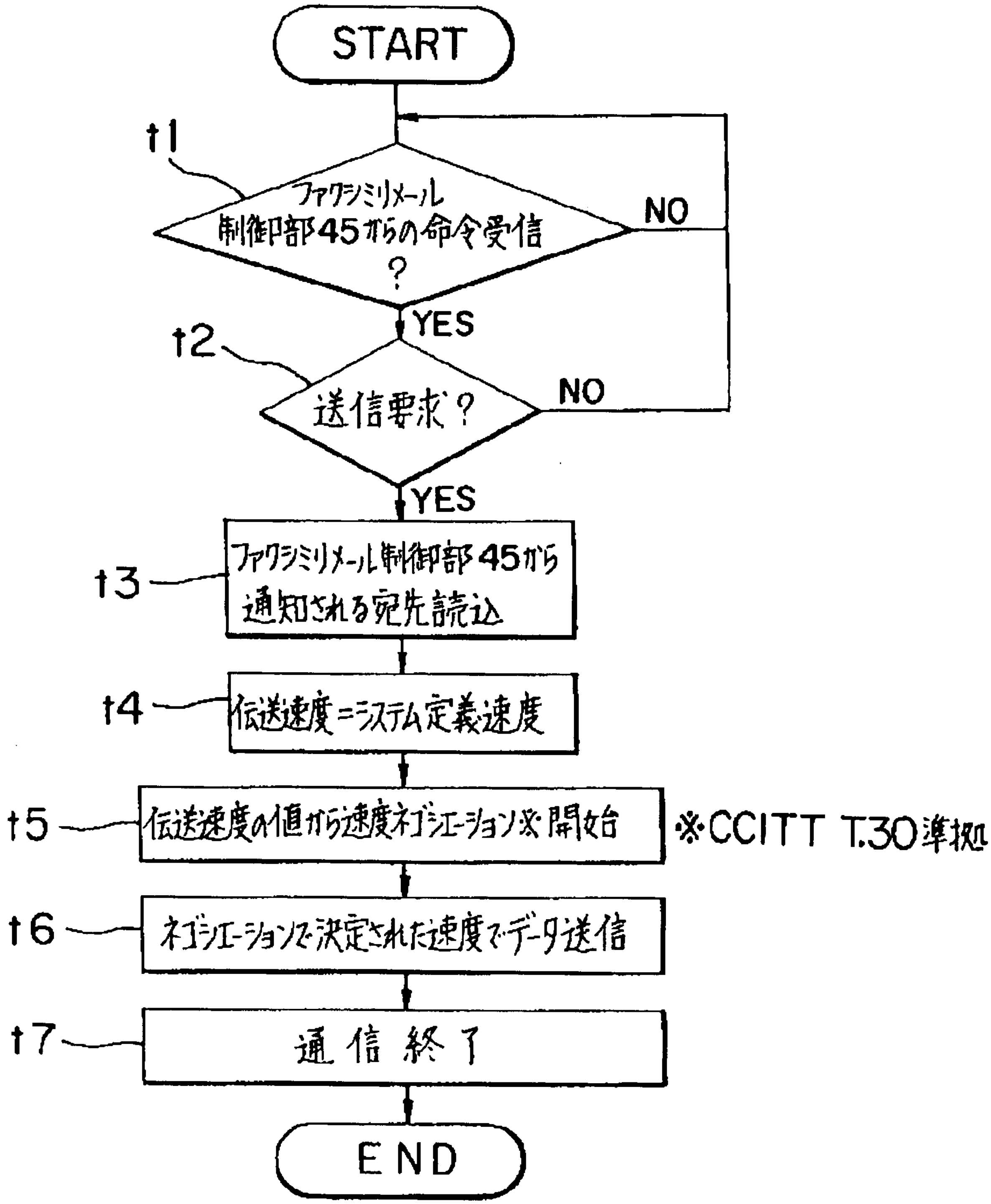
ファクシミリ通信制御部
43-A
宛先A電話番号
44-A
伝送速度情報
43-B
宛先B電話番号
44-B
伝送速度情報
42
宛先別情報格納部

従来例におけるファクシミリ通信制御部の動作フローチャート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t1
ファクシミリメール制御部45からの命令受信？
NO
YES
t2
送信要求？
NO
YES
t3
ファクシミリメール制御部45から通知される宛先読込
t4
伝送速度＝システム定義速度
t5
伝送速度の値から速度ネゴシエーション※開始
※CCITT T.30準拠
t6
ネゴシエーションで決定された速度でデータ送信
t7
通信終了
END